

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A three-dimensional object manipulating apparatus, comprising:

a display means for displaying a three-dimensional object on the screen of a display unit;

a coordinate detecting means for detecting a coordinate defined on the display screen by a user's physical touch on the display screen;

a determination means for determining an axis and direction of rotation for the three-dimensional object in a predetermined cycle on the basis of the coordinate detected by the coordinate detecting means; and

an object rotating means for rotating the three-dimensional object on the basis of the result of determination supplied from the determination means;

wherein the determination means determines the axis and direction of rotation for the three-dimensional object on the basis of a positional relation between the coordinate detected by the coordinate detecting means and a central coordinate on the display screen; and

wherein the determination means further determines a rotating speed for the three-dimensional object on the basis of a distance between the coordinate detected by the coordinate detecting means and a central coordinate on the display screen, and the

object rotating means rotates the three-dimensional object at the determined speed;
and

wherein the three-dimensional object stops rotating when the coordinate
detecting means no longer detects a coordinate defined on the display screen by a
user's physical touch on the display screen.

Claims 2-3. (Canceled)

4. (Currently amended) A three-dimensional object manipulating apparatus,
comprising:

a display means for displaying a three-dimensional object on the screen of a
display unit;

a coordinate detecting means for detecting a coordinate defined on the display
screen by a user's physical touch on the display screen;

a determination means for determining an axis and direction of rotation for the
three-dimensional object in a predetermined cycle on the basis of the coordinate
detected by the coordinate detecting means; and

an object rotating means for rotating the three-dimensional object on the basis of
the result of determination supplied from the determination means wherein the
determination means determines an axis and direction of rotation for the three-
dimensional object on the basis of a positional relation between the coordinate detected
by the coordinate detecting means and the three-dimensional object on the display
screen; ~~and~~

wherein the determination means determines a rotating speed for the three-dimensional object on the basis of a distance between the coordinate detected by the coordinate detecting means and barycentric coordinate of the three-dimensional object on the display screen, and the object rotating means rotates the three-dimensional object at the determined speed; and

wherein the three-dimensional object stops rotating when the coordinate detecting means no longer detects a coordinate defined on the display screen by a user's physical touch on the display screen.

5. (Canceled)

6. (Currently amended) A three-dimensional object manipulating apparatus, comprising:

a display means for displaying a three-dimensional object on the screen of a display unit;

a coordinate detecting means for detecting a coordinate defined on the display screen by a user's physical touch on the display screen;

a determination means for determining a moving direction for the three-dimensional object in a predetermined cycle on the basis of the coordinate detected by the coordinate detecting means and barycentric coordinate of the three-dimensional object on the display screen; and

an object moving means for moving the three-dimensional object on the basis of the result of determination supplied from the determination means;

wherein the determination means determines a moving speed on the basis of a distance between the coordinate detected by the coordinate detecting means and a barycentric coordinate of the three-dimensional object on the display screen, and the object moving means moves the three-dimensional object at the determined speed; and

wherein the three-dimensional object stops moving when the coordinate detecting means no longer detects a coordinate defined on the display screen by a user's physical touch on the display screen.

7. (Canceled)

8. (Currently amended) A three-dimensional object manipulating apparatus, comprising:

a display means for displaying a three-dimensional object on the screen of a display unit;

a coordinate detecting means for detecting a coordinate defined on the display screen by a user's physical touch on the display screen;

a determination means for determining whether the three-dimensional object is to be scaled up or down in a predetermined cycle on the basis of the coordinate detected by the coordinate detecting means; and

an object scale-up/-down means for scaling up or down the three-dimensional object on the basis of the result of determination supplied from the determination means, wherein the three-dimensional object stops scaling up or down when the

coordinate detecting means no longer detects a coordinate defined on the display screen by a user's physical touch on the display screen.

9. (Currently amended) A three-dimensional object manipulating method in which a display screen, a data processor, and a touch-sensitive coordinate detector are used, the method comprising the steps of:

displaying, under control of the data processor, a three-dimensional object on the display screen;

detecting a first coordinate defined on the display screen by a user's physical touch on the display screen;

determining, under control of the data processor, an axis and direction of rotation for the three-dimensional object in a predetermined cycle on the basis of the first coordinate detected by the coordinate detector;

rotating, under control of the data processor, the three-dimensional object on the basis of the result of determination;

wherein the data processor determines the axis and direction of rotation for the three-dimensional object on the basis of a positional relation between the first coordinate and a central coordinate on the display screen; and

wherein the data processor further determines a rotating speed for the three-dimensional object on the basis of a distance between the first coordinate and a central coordinate on the display screen, and rotates the three-dimensional object at the determined speed;

detecting a second coordinate defined on the display screen by a user's physical touch on the display screen; and

dynamically changing the axis, direction, and speed of rotation based on the second coordinate, wherein the axis, direction, and speed of rotation stops changing when the first and second coordinate defined on the display screen by a user's physical touch on the display screen is no longer detected.

Claims 10-11. (Canceled)

12. (Currently amended) A three-dimensional object manipulating method in which a display screen, a data processor, and a touch-sensitive coordinate detector are used, the method comprising the steps of:

displaying, under control of the data processor, a three-dimensional object on the display screen;

detecting a first coordinate defined on the display screen by a user's physical touch on the display screen;

determining, under control of the data processor, an axis and direction of rotation for the three-dimensional object in a predetermined cycle on the basis of the first coordinate detected by the coordinate detector;

rotating, under control of the data processor, the three-dimensional object on the basis of the result of determination;

wherein the data processor determines an axis and direction of rotation for the three-dimensional object on the basis of a positional relation between the first coordinate and the three-dimensional object on the display screen; and

wherein the data processor further determines a rotating speed for the three-dimensional object on the basis of a distance between the first coordinate detected by the coordinate detector and barycentric coordinate of the three-dimensional object on the display screen, and rotates the three-dimensional object at the determined speed;

detecting a second coordinate defined on the display screen by a user's physical touch on the display screen; and

dynamically changing the axis, direction, and speed of rotation based on the second coordinate, wherein the axis, direction, and speed of rotation is stops changing when the first and second coordinate defined on the display screen by a user's physical touch on the display screen is no longer detected.

13. (Canceled)

14. (Currently amended) A three-dimensional object manipulating method in which a display unit, data processor and a coordinate detector which detects a coordinate defined on the display screen by a user's physical touch on the display screen are used, the method comprising the steps of:

displaying, under control of the data processor, a three-dimensional object on the display screen;

determining, under control of the data processor, a moving direction for the three-dimensional object in a predetermined cycle on the basis of the coordinate detected by the coordinate detector; and

moving, under control of the data processor, the three-dimensional object on the basis of the result of determination;

wherein the data processor further determines a moving speed for the three-dimensional object on the basis of a distance between the coordinate detected by the coordinate detector and barycentric coordinate of the three-dimensional object on the display screen, and moves the three-dimensional object at the determined speed, wherein the three-dimensional object stops moving at the moving speed the coordinate defined on the display screen by a user's physical touch on the display screen is no longer detected.

15. (Canceled)

16. (Currently amended) A three-dimensional object manipulating method in which a display unit, data processor and a coordinate detector which detects a coordinate defined on the display screen by a user's physical touch on the display screen are used, the method comprising the steps of:

displaying, under control of the data processor, a three-dimensional object on the display screen;

determining, under control of the data processor, whether the, three-dimensional object is to be scaled up or down in a predetermined cycle on the basis of the coordinate detected by the coordinate detector; and

scaling up or down, under control of the data processor, the three-dimensional object on the basis of the result of determination, wherein the three-dimensional object stops scaling up or down when a coordinate defined on the display screen by a user's physical touch on the display screen is no longer detected.

17. (Currently amended) A computer readable media comprising a computer program allowing a computer to function as:

a display means for displaying a three-dimensional object on the screen of a display unit;

a determination means for determining an axis and direction of rotation for the three-dimensional object in a predetermined cycle on the basis of the coordinate detected by a coordinate detecting means for detecting a coordinate defined on the display screen by a user's physical touch on the display screen; and

an object rotating means for rotating the three-dimensional object on the basis of the result of determination supplied from the determination means;

wherein the determination means determines the axis and direction of rotation for the three-dimensional object on the basis of a positional relation between the coordinate detected by the coordinate detecting means and a central coordinate on the display screen; and

wherein the determination means further determines a rotating speed for the three-dimensional object on the basis of a distance between the coordinate detected by the coordinate detecting means and a central coordinate on the display screen, and the object rotating means rotates the three-dimensional object at the determined speed; and

wherein the three-dimensional object stops rotating when the coordinate detecting means no longer detects a coordinate defined on the display screen by a user's physical touch on the display screen.

18. (Currently amended) A computer readable media comprising a computer program allowing a computer to function as:

a display means for displaying a three-dimensional object on the screen of a display unit;

a determination means for determining a moving direction for the three-dimensional object in a predetermined cycle on the basis of the coordinate detected by a coordinate detecting means for detecting a coordinate defined on the display screen by a user's physical touch on the display screen and barycentric coordinate of the three-dimensional object on the display screen; and

an object moving means for moving the three-dimensional object on the basis of the result of determination supplied from the determination means;

wherein the determination means determines a moving speed on the basis of a distance between the coordinate detected by the coordinate detecting means and

barycentric coordinate of the three-dimensional object on the display screen, and the object moving means moves the three-dimensional object at the determined speed; and wherein the three-dimensional object stops moving when the coordinate detecting means no longer detects a coordinate defined on the display screen by a user's physical touch on the display screen.

19. (Currently amended) A computer readable media comprising a computer program allowing a computer to function as:

a display means for displaying a three-dimensional object on the screen of a display unit;

a determination means for determining whether the three-dimensional object is to be scaled up or down in a predetermined cycle on the basis of the coordinate detected by a coordinate detecting means for detecting a coordinate defined on the display screen by a user's physical touch on the display screen; and

an object scale-up/-down means for scaling up or down the three-dimensional object on the basis of the result of determination supplied from the determination means, wherein the three-dimensional object stops scaling up or down when the coordinate detecting means no longer detects a coordinate defined on the display screen by a user's physical touch on the display screen.